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THE

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AND OF

THE INSTITUTIONS IN UNION.

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TABLE OF CONTENTS.

Announcements by the Council :—Art-Workmanship Prizes ... ... Page 105
Proceedings of Institutions :—Bingley Mechanics' Institute—Llanelly Athenæum St. George's and St. James's, Westminster 105
Dublin International Exhibition, 1865 ... 108
Invulnerable and Unsinkable Ships of War 108
Fine Arts :—Descriptive Labels in the Louvre—Sales of Works of Art in Paris —Miscellaneous Sales—Church Decoration in Paris—Monument to Counts Egmont and Horne—Public Statues and Portrait Galleries—Artistic Benevolence—Sale of Objects of Vertu—Convention between France and Switzerland, respecting Works of Art, &c. 109
Manufactures : — China Grass — Coal in France—New Thermograph—Sun Motor—Scotch Pig Iron—Slate in New South Wales — Preserved Fish — Silk Culture—Paper Making ... 110
Commerce :—Cultivation of Tea in India 111
Colonies :—Sidney Fish—Ailanthus Silkworm — Cotton in Queensland — New Zealand : Seat of Government—New Zealand Telegraph 112
Obituary :—M. Guillaumin, publisher, Paris 113
Publications Issued :—Practical Dietary for Families, Schools, and the Labouring Classes—The Farm Homesteads of England 113
Notes :—Poultry Show in Paris—South Kensington Museum "Boxing Days"—Warming of Railway Carriages—French Academy of Inscriptions and Belles Lettres—German Pictures—Naphtha Springs—Proposed Potteries Industrial Exhibition—Scholastic Registration—Public Works in Paris—Steam Omnibus — Electro Magnetic Locomotive—The Atlantic Cable—Chinese and Japanese Works 114
To Correspondents 116
Meetings for the Ensuing Week 116
Patents 116

Announcements by the Council.

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ART-WOKMANSHIP PRIZES.

The Articles sent in competition for the Art-Workmanship Prizes are now arranged for display in the Society's Great Room, and the Members of the Society, as well as Art-Workmen, are invited to inspect them daily between the hours of 10 and 4.

To suit the convenience of Artizans, the Exhibition will be open on the evenings of Wednesday, Thursday, and Friday next, from 7 o'clock to 10.

The Council have invited a Special Meeting of the Exhibitors and Friends for Monday evening next, at 8 o'clock.

Proceedings of Institutions.

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BINGLEY MECHANICS' INSTITUTE.—The completion of the new Mechanics' Institute at Bingley was inaugurated by a soirée on the 14th of November. The Institute is built from the designs of Mr. Waterhouse, of Manchester. The style of architecture is Gothic, and the building forms a prominent and attractive object in the main street. The Institute consists of a large school-room for the accommodation of the evening classes; four class rooms, for the teaching of the more advanced branches of education; a library, news-room, and a large hall for the delivery of lectures. The hall is capable of accommodating upwards of 500 persons. ALFRED HARRIS, jun., Esq., the President, occupied the chair, and amongst a large number of gentlemen who supported him were E. Baines, Esq., M.P., W. E. Forster, Esq., M.P., Alfred Harris, Esq., Isaac Holden, Esq., Mr. Alderman Law, Rev. A. P. Irwine, M.A., Samuel Rhind, Esq., Thomas Baines, Esq., Rev. A. McKechnie, Capt. Ellis, Bingley; H. Illingworth, Esq., Bradford; J. Oddy, Esq., Birkenshaw; T. Horn, Esq., Morton; E. Sharp, Esq., A. Sharp, Esq., J. N. Thacker, Esq., Mr. W. E. Skirrow, Mr. B. B. Skirrow, Mr. J. Dickenson, &c.—The CHAIRMAN said—The inauguration of this new building is an event which has been for several months looked forward to with great interest by most of the inhabitants of our town; and in now meeting to celebrate it, we may safely say that the anticipations which have been formed of the general appearance of the building—of its convenience of arrangement, and general adaptability to the purposes for which it is intended—are fully realised. It will, I am sure, be evident to all who are here this evening, that this building is one which is likely to give scope for a great spread of educational influence in our town. It will be surmised that the result we have attained could only be arrived at by a considerable outlay of money. The cost of the building and furniture, including the various items for heating, lighting, and decorating, will not fall short of £2,600 when all is completed, and the subscription list, standing still at £1,410, causes us some little anxiety as to the pressure of the heavy balance of debt on the Institution. A Mechanics' Institute was first founded in Bingley by a few friends of education in 1832. After a languishing existence of five years it came to an untimely end, but was renewed in the year 1840. It continued on a small scale, with more or less success, until 1849: in that year the rooms were taken in which it has been carried on up to the present time. At the annual meeting in 1863, the number of members was 341; this year it is 411. The increase has been principally in female members: last year these numbered only 26, this year there are 68. In the library there are 1,196 volumes of books. The books have been much better read in the current year than in the year preceding, the issues being 5,008 in 1863, against 6,112 in the current year. These numbers show that the members have made a diligent use of the small library which we possess. During the past year lectures have been delivered by the Rev. P. A. Irwine on "Mahomet," Rev. J. Ward on "Earthquakes," Rev. Mr. Heron on "Young Bingley," Mr. W. Newsome on "Self-Culture," and Mr. N. Walbank on "Crusades." A penny bank, in connection with the Institute, has been several years in operation. The influence which literature exercises over the minds of young people, especially those who seek it of their own accord, either for instruction or for amusement, is so great that Mechanics' Institutes should furnish to their members the very best class of reading, and works in each department of literature should be carefully and judiciously selected for the library. I am by no means an advocate for placing in the hands of our members dry and abstruse treatises or works of a nature too learned for the general abilities of the readers for whom we have to provide; but there are now many works published which it is desirable for these Institutions not to encourage—works which are not wholesome intellectual food, and the reading of which neither enlightens the mind nor elevates its moral susceptibilities, works which do not give a true picture of human life, but which appeal to the lower feelings of man's nature, by gross exaggerations of the vices and follies of the vicious and foolish of our species. The influence of works of fiction on the mind is by no means to be under-estimated as an element in mental culture, especially for the hard-strained sons of toil who seek, and justly so, in their literary pursuits, relaxation from the hard stress of labour; therefore, in selecting works of this class from the large field now laid open to the reading public, we should exercise much discretion, so that we may place before our members a good and wholesome intellectual diet, scrupulously avoiding all that is of a baneful or poisonous nature. It may perhaps surprise some of our friends from a distance to hear that the young lads of Bingley, to the number of 100 and upwards, are regular attenders at the night school, and may be seen zealously plodding over their slates and copy books of an evening, instead of wasting their time in idleness or vice. The girls' school, too, is in a flourishing condition, and is attended by about 50 of the female members of our Institute. Whilst these facts are very encouraging, we feel that a wider task is opened before us, and that we must try to lead on our young members who attend the evening schools into higher knowledge and more noble attainments. French and German are now becoming necessaries of commercial as well as of intellectual life—they should be freely encouraged here for those who desire to learn and who will afford the necessary time and cost to attain them. The study of history, a most important branch of education for the working classes, should also find its votaries within these walls—and a well-regulated course of historical study requires the mechanism of master and pupils to make it efficient. Mathematics and mechanics, too, are highly important to our working men in this district, where each man earns his bread by directing and assisting those great forces, steam and iron, which, brought under the control of human intellect, have been moulded and framed into machinery whose magic power is only equalled by its fairy fineness. The number of members attending the drawing-class is but small, yet if our working men and women knew that one of the greatest requirements of our age is experienced art-labourers, they would consider rather seriously whether within themselves may not lie concealed the germs of that glorious faculty which enables mankind to create worlds of beauty, of grace, and of comeliness, out of materials low and base in themselves. I repeat that one great want of our age, in architecture, in pottery, in manufactures of every kind, is an array of art-workmen and art-workwomen; and I assert that more agreeable, more noble, and more profitable employments, available for the poorer classes of our population, do not exist than those of skilled art-workmen and designers. But in these departments spurious knowledge is worse than worthless, it is positively baneful—therefore the necessity of earnest study in their attainment. I know great difficulties have to be overcome in the study of art (as in all other noble studies), and one of these is the temptation to the young student to become an artist. If any young men are here who are studying at the drawing class, my advice to you is, learn what is useful, not what is fine; learn what you can apply to your trade, what will help you in earning your daily bread. Don't strive to paint pictures except for your own amusement and pleasure. You may learn to succeed in drawing models for machinery, in applying your knowledge to stone-cutting and wood-carving, or you may learn to design a pleasing combination of colours, or a simple pattern for a dress-piece; but do not be led away by the idea that you will paint pictures which will sell, because you will, as a rule, only experience disappointment if you are. The name Mechanics' Institute hardly conveys a proper notion of the actual composition of a society like ours. The members in this Institution belong to all classes of society, from the gentry of the neighbourhood and the master manufacturers down through the various grades of tradesmen and shopkeepers, shopmen, overlookers, clerks, farm labourers, combers, weavers, and spinners; resting thus on the broadest possible basis, it stands safe against the accusation of being subject to any class or party interest; and it is of the utmost importance that this broad basis should be carefully preserved; and also that every adult member should feel a personal interest in seeing that the management is confided to those in whom entire trust can be reposed, and who will work the Institution for the general good of the whole body of members, without party or sectarian leanings. In the early days of Mechanics' Institutes, it was considered by some, who had the welfare of the people at heart, that it was desirable not only that they should be principally composed of, but that they should be entirely conducted by, working men. At first sight there may be reasons which commend this view of the subject, but I never could agree with the propounders of the theory; for I am strongly of opinion that one great benefit resulting from Institutions of this kind is the friendly intercourse which they promote among the various classes of the community, and the creation of kindred interests and feeling between them by the kindly co-operation of rich and poor, of high and low, in one common object—the alleviation of moral want, and the supply of mental food to those whose position in life may prevent them from obtaining it elsewhere. I believe that these good feelings and sympathies between class and class do grow out of these Institutions when conducted on sound principles—that good results are produced to all who impart or receive their advantages—and that all who attempt to narrow the basis on which their moral structure should rest, by centralising the control of them in any one class, are not the true friends of the working people. Our own Institution is a fair sample of the results of united efforts among the various classes of our townspeople. Had it not been for the active help and liberal donations of the middle and upper classes, it would have been impossible for this Institution to have possessed the handsome building in which we are now assembled, and which may be regarded as an inheritance committed to trustees by the friends of education and mental enlightenment for the benefit of all classes of the inhabitants of this town, but, of course, especially for the benefit of that large, hard-working, and industrious class of artisans, who could not have obtained such an advantage for themselves, except by sacrifices which it would have been hard for them to make, and unreasonable to have been expected from them; no further stipulation being required from those who enjoy it, but a steady adherence to the principles on which this Institution is founded. And again, had it not been for the hearty support which the Institute, on its old basis, received from the working population, there would not have been a sufficient inducement for the middle and upper classes to come forward, as they have done, to supply the want of increased accommodation so keenly felt by the members. Here, then, we see an example of what may be done by the kindly co-operation of class with class. And it may be felt as a cause of thankfulness by some that they may impart, and by others that they may receive, the benefits which the Giver of every good and perfect gift places it in the power of one man to give and another man to enjoy. —Mr. E. Baines, M.P., referring to the many branches of education in science and art which might be embraced in the curriculum of the Institute, urged the importance of the members taking part in the examinations instituted by the Universities of Oxford and Cambridge, and illustrated the value which was attached to one of their certificates by relating the case of a young man—an old member of the Leeds Mechanics' Institute—who obtained an excellent situation in the back States of America by producing as his reference such a certificate. It was not merely a certificate of a certain amount of requirements on the part of the man; it was a certificate of habits of application that had been learned in the Institution and of the good effect produced on his moral character by his connection with the Institution. He then alluded to the superior advantages enjoyed by the young men of the present day over those enjoyed when he was a young man, and referred to the increase which had taken place in cheap, good, and abundant literature to an extent which not even the most sanguine could have dreamt of thirty years ago. From the year 1831 to 1864, the issue of newspapers in the United Kingdom had increased more than thirteen-fold, and that of serial publications more than fifteen-fold. As regards the quality of these publications, he might mention that of the 3,600,000 copies of serials issued monthly in London, 1,900,000 were positively religious magazines; one quarter of them were issued by the advocates of temperance and total abstinence, and the rest were magazines of a high literary and scientific character. The circulation of the weekly publications was 2,500,000, and of these one-fifth were distinctly religious; one-third were of an educational and literary order; two-fifths were novels, tales, and biographies of an unexceptionable character, and only one-twelfth were of that directly immoral and impure character to which he supposed the Archbishop of York referred, when, in a recent speech, he condemned sensational novels, and those romances which were calculated to excite wonder and horror—such miserable trash that he wished there were none of them. Only 9,000 copies out of 2,500,000 published weekly had an immoral tendency, and he found that three years ago the number was 52,000. Those issued of a sceptical or decidedly irreligious character only numbered 5,000. With the advantages conferred by Institutes like the present, and by such a large mass of valuable, pure, sacred, moralising, elevating literature, the young men of the present age ought to be a more enlightened, more active body than their fathers could by any possibility be. He hoped that to the hard heads and good principles of their fathers the young men of Bingley would add that knowledge which would make them more useful to themselves and to the world around. After alluding to the recent working men's industrial exhibition in London, as proving that the working men of England could turn their talents to other trades besides their own, and that a change of occupation was more of a relief and amusement to working men than time spent in frivolous amusements, Mr. Baines concluded by recommending the Committee of the Institute to issue a circular yearly to the youths who were retiring from school, inviting them to become members, and also take an active interest and sympathy in their studies.—Mr. W. E. Foster, M.P., congratulated the assembly upon the inauguration of their Mechanics' Institute. They had certainly got the most handsome building of the kind he had ever seen. When Mechanics' Institutes were first started, under Dr. Birkbeck, they were a little too ambitious, and thought it would be possible to dispense altogether with elementary teaching and to give the working man a superior education. It was found, however, that artisans did not possess that elementary education which would enable them to take advantages of the higher branches of learning, and the result was that these Institutions fell away from their original design, and they became Institutions more for the education of the middle class than the instruction of the mechanic. These Institutions had found that they could not impart a superior education to the working man until he became master of elementary learning. Consequently, elementary night schools were acknowledged to be one of the principal objects of Mechanics' Institutes, and he did not think that there was anything that did so much good. He hoped that no person would feel discouraged in acquiring elementary learning, because he had not had the advantages of early learning. He had had at his house, when on a visit to this neighbourhood, a very gentlemanly man, who did not learn to read till he was twenty-one or twenty-two years of age, and yet he was now a very able and intelligent man. He believed that it was only this year that this same man, at the meeting of the Association for the Promotion of Science, at Newcastle, made a speech in defence of a particular theory, and which was acknowledged to be by far the best speech on the occasion, even in a discussion amongst scientific men on a scientific question. This man was William Craft, the Negro, and formerly a slave. They need only take the example of William Craft as an illustration of what a man might effect for his improvement when he had a determined purpose. He was glad to find that there was a class for the study of the French language connected with the Institute. A knowledge of the French language was becoming of more importance every day. Now that there was a large trade between this country and France, it was necessary that all those who were employed in this trade should have associated with them those who were competent to speak and write the French language. A knowledge of the French language, therefore, would be of the greatest advantage to young men in enabling them to obtain better situations and to promote their own advancement. It was the duty of all to promote the education of the people to the fullest extent. Whatever progress was made in England, he believed that the West Riding would be in the van. It was more necessary that in this district the working classes should be prepared to assert their position in the van of England's progress. What they were doing at Bingley was a proof that they understood the position they were destined to occupy.

Llanelly Athenæum.—On Friday last, 23rd December, Mr. F. E. Bodkin concluded a course of four lectures on Geology, which he has delivered at this institution. Mr. Bodkin has kindly taken the trouble of classifying and arranging a large collection of minerals presented to the institution by Lord Cawdor, and had at the earnest request of the managers consented to deliver the lectures in question, which have been extremely well received; a cordial vote of thanks having been tendered to the lecturer at the termination of his voluntary and gratuitous labours. Mr. F. Bodkin is the grandson of the Assistant-Judge, one of the Vice-Presidents of the Society of Arts.

St. George's and St. James's, Westminster.—On Friday, 23rd December, a public meeting of the St. George's and St. James's local board for promoting the education of adults, in connection with the Metropolitan Adult Educational Association and the Society of Arts, was held in the lecture theatre of the School of Mines, Jermyn-street, to explain the objects of the board, the system of examinations, certificates, prizes, &c.; Wm. Hawes, Esq., in the chair. The Chairman said the objects of the association were very important. In former times young men had no means of testing their abilities or acquirements; but when the Society of Arts established the system of examinations, conducted by the agency of local boards, every man could offer himself for examination. The chairman proceeded to detail the objects of the association, and urged the young men and women employed in the district in shops and other avocations, to join the association with a view to future improvement and success.—Dr. Drewitt proposed the first resolution—

"That it is desirable to promote as far as possible the education of adults; that the present time, owing to the early closing movement, furnishes a fitting opportunity for carrying out the object, and that this meeting pledges itself to use its best efforts for the purpose;" this was seconded by the Rev. Mr. White, and unanimously adopted. The Rev. Mr. Macilwaine, in moving a resolution acknowledging the steps which had been taken by the Society of Arts and the Metropolitan Association for the Promotion of Adult Education, expressed an opinion in favour of local organization as the best means of rendering those steps more effective. The motion was seconded by the Rev. Mr. Edwards and unanimously agreed to. A resolution to the effect that the union of interests between the inhabitants of the parishes now appealed to afforded special facilities for the formation of a united local board in connection with the present association and the Society of Arts, was also unanimously agreed to; and the meeting then separated with votes of thanks to the Duke of Marlborough for accepting the office of president of the local association, to the committee of Privy Council on Education for the use of the theatre, and to the chairman for his conduct in the chair.

DUBLIN INTERNATIONAL EXHIBITION, 1865.

The Belgian Commission (at whose head is placed M. Fortamps, the able Commissioner in 1862) have forwarded the list of their own manufacturers who purpose to become exhibitors. Lace, of course, occupies a prominent position, and we are able to report that Belgium will be remarkably well represented in this important branch of industry. The well-known firm of Cail, Halot, and Co., have promised railway and agricultural machinery and engine-tools. Chemical manufactures will include ultramarine, soaps, and perfumery. Liége will send a large display of arms, especially rifles; and Ghent a collection of leather goods. Metallic manufactures, glass, and china, are all to be well represented; it is only necessary to mention the name of Dufour among the goldsmiths, Demol for porcelain, and Bogaerts for bronzes. The names of contributors to the Fine Art section are too numerous to quote; but we are assured that the best specimens of the modern Belgian school of painting will have a place in the Exhibition. Among the painters, Billoin, Kindermans, Keelhoff, Roffiaen, Van Moer, Van Severdonck, Verboekhoven, and Willems, are already known by their works in the Great Exhibition of 1862. Among the sculptors and medallists, we may, for a similar reason, specify Fraikin, the two Geefs, and Wiener.

INVULNERABLE AND UNSINKABLE SHIPS OF WAR.

By J. Kennedy.

If in theory the science of attack has no limit, neither has the science of defence; the latter will develop with the former. A big and powerful gun means a big and powerful ship; and if ships are to be armed with 300 and 400 pounders, the defensive armour on the exposed parts of the ship's hull must be made to resist this gun, for it will not do to let the projectile get inside of the ship or pass right through, as it might enter just above the water-line and pass out on the opposite side below the water-line, and so bring about the destruction of the ship. A ship may be shielded to effect this object, though her dimensions must be augmented, not by adding to the length, but by increasing the beam considerably. The height of the solid work (a top height) above the water-line being exposed surface, and having to be covered with armour, is a fixed particular; for, whatever the other dimensions may be, she must—for a comfortable ship when cruising at sea during bad weather—have a certain height of top-side out of the water, or else the upper deck will be constantly swept by green seas. This height may be limited to ten feet above the loaded water-line, when ready for sea, in the case of all iron-clads, though it precludes the use of broadside guns as carried by the *Warrior* and her sister ship. This surface above the water line tumbles home very considerably, and is convex throughout, fore and aft. The proposed descriptive dimensions of this ship are:—For length on the loaded water-line, 400 feet; breadth outside, 82 feet, and depth in the water as she would be ready equipped for sea, 22 feet; tonnage, builder's measurement, 12,546 tons; loaded displacement to 22 feet depth, 13,500 tons, with a formation of immersed surface which at all points will offer the finest angle of contact to the water particles during a direct motion; with due inherent stability for resisting the momenta of all the weights carried aloft, viz., defensive armour, turrets, and guns, &c., when oscillating heavily in a rolling sea-way, and thus avoid the necessity for carrying counter-weighting; without any vertical surface at the extremities, as gripe and heel, or dead wood, which opposes the lateral motion of the bow and stern of the ship during steerage, and gives the rudder more work to do: and with a double or biformation of the ends fully developed at the after body and partially at the bow body; an easy bilge section outside the midship longitudinal body, which is 30 feet wide; parabolic, horizontal, and diagonal sections, and elliptical cross-sections of the outside longitudinal bodies, and fitted with two propellers and two rudders upon the double after ends, the propeller shafts being hinged at some distance from the propellers, to allow the propellers and shafts to be hauled up together into suitable recesses in the counter, a ready way of disposing of them when canvas has to be the only propelling power.

The outer shell of the hull may be precisely the same as any ordinary iron ship, being virtually one unbroken skin up to the top-height. The armour, which is carried inside of this shell upon shelves of sheet iron 12 inches apart, consists of slabs of rolled or hammered iron of any convenient length, with a triangular or wedge-shaped section six inches deep at the thick edge, and twelve inches broad. These are piled flat way on the shelves, one above another, thick and thin edge alternately having layers of felt placed between each. The whole depth of the armour is then substantially backed up by stout iron framing and truss work from the inside, which is continued down to the flat floor. Strong diagonal braces of iron connect the upper portion of the ship at one side with the bilge on the other. These are any convenient distance asunder, and need not interfere with a free course throughout the ship between decks. They will impart great stability to the armoured portion of the ship's hull, and prevent any vibration taking place.

After the necessary space has been set apart for the engines and boilers, coal bunkers, powder magazine, and for the stores and equipment, the remainder of the space in the hull below is divided off into numerous well spaces, which are to be ten feet square, and from the lower deck down to the flat floor. These well spaces are made by dividing this portion of the ship off by means of vertical partitions or bulkheads, fore and aft and athwart. These partitions are to be of thin iron or steel, and a few of them will be continued up to the upper deck. They will thus impart great strength and rigidity to the structure, as well as render the ship less liable to be sunk. The upper deck beam plates are covered above and below by thin iron sheeting, to enclose a water-tight space partitioned off, which corresponds to the depth of the beam plate. Some hundreds of tons of floating power can thus be gained. The lower deck consists of iron sheeting carried over the upper edges of the transverse and longitudinal bulkheads. No beams are required at this deck. Man-holes or doors are made over each well space. A double skin throughout the bottom, giving a space of some 24 inches, would be a further advantage, by way of diminishing the chances of sinking. By way of a further precaution against the liability of these iron ships to sink without giving any warning, all the spare room below the 'tween decks is occupied by thousands of light, hollow, spherical vessels. These are made of steel, or malleable iron of very tough quality. The figure of the sphere or globe, being that capable of offering the greatest resistance to external pressure, is preferred. They may be 24, 36, and 48 inches in diameter. A sphere 48 inches in diameter contains 31·51 cubic feet in the solid, and 500 of them would be equal to 16,755 cubic feet, which, reduced to tons of water, equals 478½ tons, and if we allow five tons for the weight of metal in them, they yield 473½ tons of floating power. This shows that were these hollow spherical vessels placed in the compartments, not otherwise occupied, in sufficient numbers, they would guarantee the ship from being sunk under the most destructive fire from forts or ships. The chances would be very much in favour of a ship so provided with this description of floating power holding out to the last. In preparing a ship to go into action all the available space, even between decks and in the engine-room and about the boilers, might be filled up with these spherical hollow floating vessels, for all that can be done in this respect, no doubt, would be only a prudent precaution against instant destruction by sinking.

As regards the means of obtaining sufficient numbers of these hollow globes, they may be manufactured by existing machinery, and turned out in considerable numbers by a few men and boys in a very short time; and, as one essential property they must possess is extreme lightness, the quantity of metal used up in their manufacture will be very small, and the cost, therefore, will be comparatively trifling compared with their immense utility.

The problem of how to apply iron, steel, or any other suitable metal of excellent quality, to the construction of ships of war or other vessels, so that the greatest amount of strength with lightness may be gained, and at the same time to render the structure incapable of being sunk until it is absolutely broken up, is a very simple one, and may at once be practically resolved, whilst the question of invulnerability to attack by 400-pounder guns depends upon providing a ship of sufficient buoyancy, with great proportionate beam, and in doing away with the present broadside armament as carried by ships of the *Warrior* class.

A ship of the above description, in lieu of broadside guns, would have two rows of fixed turrets carried on the sides of the upper deck, close up to the waterway, and a turret at each extremity of this deck—ten turrets in all—armed with two guns in each, of the heaviest calibre, with sheet-iron bulwarks arranged between the turrets, adapted for sliding down inboard.

Fine Arts.

Descriptive Labels in the Louvre.—An excellent method of furnishing the public with information respecting works of art is now being put into practice in the gallery of the Louvre. Tablets, on which are inscribed the subject of the adjacent pictures, together with the names of the artists, the dates of their births and deaths, and the title of the school to which they belong, have been placed, at intervals of about six yards, along a portion of the Italian department of the gallery. These tablets are conspicuous enough to attract attention, and cannot fail to make many persons, unversed in matters of art, think a little, at least, about the pictures, which otherwise they might, and very often do, regard as mere pretty curiosities, and this will be a real step towards art education.

Sales of Works of Art in Paris.—The true fine art season in Paris will commence with one of the most important sales that has taken place for a long period, the famous collection of the late Comte de Pourtalès-Gorgier, who died ten years since, known as the Pourtalès gallery. The sale is divided into ten portions, to occupy thirty days, and is spread over the period commencing with the sixth of February, and ending on the fourth of April. The catalogue is divided into three portions—objects of art and curiosity, medals, and pictures. The various sections will be sold in the following order:—Egyptian and other ancient bronzes, terra cotta, &c.; painted Greek vases—these alone will occupy four days; engraved gems and stones, statuettes in silver, jewels, and ancient glass; medals, ancient and modern; sculpture in marble, ivory, and wood; bronzes, faïences, enamels, arms, &c., of the middle ages, and renaissances; ancient curiosities of various kinds, European and oriental; ancient sculpture, tables, vases, &c.; modern paintings; and lastly, the works of the old masters, drawings, &c. Amateurs, and all connected with the fine arts, are looking forward to the Pourtalès sale with great interest.

Miscellaneous Sales.—Pictures and other works of art are fetching small amounts at the present moment in Paris. At a sale, consisting principally of works from the Chateau of Belfort, a holy family, attributed to Andrea del Sarte, the Virgin, with the infant Jesus on her knees, Saint Elizabeth, holding the young Saint John by the hand, opposite, and Joseph behind the Virgin, was withdrawn at 10,000 francs. "The Three Graces," and "Mademoiselle de la Vallière," by Pierre Miguard, formerly the property of Louis Philippe, a large picture, was purchased for the Troyes gallery for £100; a portrait, by Govaert Fluick, sold for £40; "Le Passage du bac," by Salomon Ruysdael, 960 francs (£38 8s.); "Pilgrims praying before a Chapel," by the elder Teniers, only fetched 245 francs (£9 16s.); and a group of peasants dancing before a farm, by the same, 411 francs (£16 8s. 10d.). The well-known "Girl with Dog," supposed to be by J. B. Grenze, fetched 354 francs (£14 3s. 4d.); a landscape, with animals, attributed to Cuyp, was withdrawn at 10,000 francs; a head of Cæsar, by Ary Scheffer, sold for only 150 francs (£6).

Church Decoration in Paris.—A sum equal to £11,584 has been devoted to the decorations of the new Church of St. Augustin. The interior of the cupola is to be illuminated with large figures, sixteen in number, of prophets, saints, and fathers of the church, surrounded by cherubim, on a blue ground, studded with golden stars; in the pendentives are to be painted the four evangelists, accompanied by angels; the vaultings of the side chapels are to be painted with six subjects from the lives of St. John, St. Peter, and St. Paul; these, with one or two minor commissions, amount to nearly £2,880. The stained glass, and three medallions beneath the porch, in distemper colours, enamelled, amount to £2,760. The sculpture includes a bas-relief, for the porch, of Christ and the twelve apostles; a marble statue of the Virgin Mary; more than twenty statues of the evangelists and saints, for the decoration of the façade of the building, with minor works in stone, and bronze figures for the doors—together, £5,944.

Monument to Counts Egmont and Horne.—On the seventy-fourth anniversary of the birth of King Leopold, a fine monument, by Fraikin, in memory of these victims of the ferocity of the Duke d'Albe, was uncovered in the Place of the Hotel de Ville, at Brussels, where they were beheaded in 1568. The Burgomaster had specially invited the attendance of the presidents and members of the societies of archers and crossbow-men, who still keep up the customs and oaths of the ancient guilds. These companies, in 1568, in spite of the despot who then ruled over the land, took upon themselves the honour of paying the last tribute of respect to the remains of the unhappy counts. It was right that their representatives should in 1864 have the honours of the inauguration of the expiatory monument. The pedestal has, with more than doubtful taste, been adapted to the purposes of a public fountain. It is true that the French have done the same in the case of Molière and others, and that we have, once at least, committed the like solecism, but a hundred such precedents would not warrant such a violation of good taste and propriety.

PUBLIC STATUES AND PORTRAIT GALLERIES.—The *Conseil-Général* of the Meuse has decided on creating, in the town of Bar-le-Duc, a gallery of portraits of the generals and marshals natives of the department, and the execution of the portraits has been confided to M. Gabriel Lefébure, a painter of history. It is hoped that other departments will follow so good an example, but that the list will be extended so as to include not only the military, but also literary, artistic, scientific, and other celebrities. Everybody can understand a portrait, and local *amour propre* alone would render such galleries popular, and aid the growth of a taste for art. A statue is to be erected at Villers-Bocage, near Caen, to the great self-made manufacturer Richard Lenoir, after whom one of the new Paris boulevards is named; the work is entrusted to M. Louis Rochet, the sculptor of the equestrian statue of William the Conquerer, so popular in Normandy, and it is to be finished next year, and inaugurated on Lenoir's centenary anniversary. The funds have been supplied by subscription amongst the inhabitants of the department of Calvados. The Minister of the Fine Arts has just presented the town of Abbeville with a magnificent marble bust of the poet Milleroy, who was a native of that place. The competition for the statue of M. Billault to be erected at Nantes, has failed, none of the designs having been considered satisfactory. Four of the competing artists have been invited to send in other models. It is whispered that the sum devoted to the purpose of the statue is so small that artists of known ability and standing declined to enter the list.

ARTISTIC BENEVOLENCE.—A young painter of Paris having been struck with paralysis, a number of his brethren resolved to contribute each a picture or drawing to be sold for his benefit. The sale took place the other day, and realised 15,000 francs (£600). Four pictures, by M. Corot, fetched 2,080 francs; one by Daubigny, 375 francs; a Bonnat 340 francs, &c. Such an act of benevolence deserves to be recorded.

SALE OF OBJECTS OF VERTU.—The collection of a well-known artist and amateur, the late M. Mathieu Meusnier, was sold in Paris last week, and exhibited the growing taste for old *faïence* and other productions of that class. A large rustic basin, by Bernard Palissy, sold for 600 francs; a curious circular dish, or salver of Pesaro ware, of the sixteenth century, bearing the inscription, "*Io ma Rechon an da Dio*," and decorated with a figure of a knight in armour, after the style of Albert Durer, 280 francs; two apothecaries' beakers, of Florence ware, 200 francs; a plate of Persian manufacture, 301 francs; a large vase, ornamented with flowers in relief, made at Marans, near La Rochelle, 470 francs; a large apothecary's beaker (*aignière*), of Nevers ware, 335 francs; a number of plates, jugs, basins, and other articles of Rouen manufacture, from 100 to 200 francs each; a small finger fountain, of the ware of the south of France, decorated with a view of Marseilles, 310 francs; a large covered cup, of the same kind of manufacture, 310 francs; an oval dish, of Moustiers make, 260 francs; a Burmese knife, the blade damascened, 860 francs; a carved boxwood comb, inlaid with ivory in colours, an Italian work of the fourteenth century, from the Debruges, 305 francs; an engraved key, French, of the sixteenth century, 325 francs; a Gothic lock, 420 francs; two large cups, in Venetian glass, ribbed blue and gold, 450 and 430 francs respectively. In the same sale, a marble statue of the Queen Marie Amelie, by M. Meusnier, after a small model by Pradier, sold for 2,100 francs (£84).

CONVENTION BETWEEN FRANCE AND SWITZERLAND, RESPECTING WORKS OF ART, &C.—A convention has been signed by the two governments, by which the literary and artistic productions of each country will be protected in the other. The convention is for twelve years from the 1st of January, 1866, and applies to printed matter, music, and works of art of all kinds.

Manufactures.

CHINA GRASS.—A very important paper has just appeared in the *Moniteur* of Paris, namely, a report approved by the Chamber of Commerce of Rouen, on the value of "China Grass as a Rival of Cotton." Previous announcements had appeared, in which great expectations were held out, and now we have the recorded opinion of experienced men, backed by the approval of the Chamber in the same sense. Passing over the enthusiastic expressions with which the report is introduced, we proceed to extract the mere facts as given in the report in question. In the first place the samples and products, on which the report is based, were exhibited for several weeks in the hall of the Chamber of Commerce at Rouen, and inspected by a large number of manufacturers of and beyond the district of which that town is the centre, a fact which the reporters quote as giving additional weight to their conclusions. "We made it our duty," says the report, "to collect the observations which reached us, and all may be summed up in this—that the specimens exhibited show excellent results corresponding exactly with the propositions of the Chamber, namely, to find a fibre capable of being manipulated without difficulty by means of the machinery used for spinning and weaving cotton, and which, moreover, can be dyed by the same processes as cotton; in short, everything tends to prove that a true substitute for cotton has been found." The first experiments having been made with small quantities of the grass, the Chamber purchased about six cwt., a third of which was operated on by the reporters or under their inspection, with the following results:—The grass was mixed with an equal quantity of Indian cotton, and worked in the ordinary manner; the carding alone presented some difficulties, but these the reporters believe may be very easily removed. No difficulty arose in the spinning. The yarns produced were Nos. 11 and 17, and these were employed in making a piece of *Cretonne*, military calico, 76 centimètres wide, and weighing 17 kilogrammes per 100 mètres, and four pieces of *Longotte*, or coarse cotton for printing, each measuring about 85 mètres, 93 centimètres in width, and weighing $16\frac{1}{2}$ kilogs. the 100 mètres. The mixture of China grass is said to give to the fabrics increased strength. The mixed yarn was rather less elastic than one of pure cotton, but this rigidity is regarded as an advantage as respects the duration of the fabric produced. As regards dyeing, eight cuttings of the mixed fabric were treated together with a similar number of pieces of pure cotton by the madder process, and the black, red, purple, violet, and orange are declared to be all that could be desired. Some doubt was felt about the "violet savonné," but the result is reported to be equal to that of the same colour obtained with pure Louisiana cotton, and even more brilliant. The deduction is that China grass has as much affinity for colours as the best cotton, that mixed with inferior cotton a "good middling" is obtained which dyes as well as the best average cottons, and that, consequently, there is a real economy in the employment of China-grass as regards taking colours. As respects elasticity and resistance the *Longottes* in the rough was 93 centimetres wide, and when bleached and dyed 80; 157 $\frac{2}{10}$ mètres of the former gave 161 $\frac{6}{10}$ of the latter, a result, equal it is said, to that of fabrics of Louisiana or Jumel cotton. The weight, too, bore the same proportions, namely, about one-eleventh less after bleaching and dyeing. Strips of the mixed cloth, ten centimètres long by five wide, were tried, for strength, by the dynamometric test, adopted by the Minister of War, and the result, as compared with similar strips of cotton unmixed, was as follows:—suspended the way of the warp, the mixed fabric exhibited rather less, while by the warp it had the advantage. As to the important element of price, the following are the facts set forth:—100lbs. of China grass yield 75 parts of yarn, 8 parts fit for paper-making, and 17 parts waste, fit for manure. The cost of the fibre, as prepared for spinning, is put at 1fr. 57c. the kilogramme, or less than 7d. per lb., presenting an economy, as compared with Egyptian cotton at the present time, of nearly two shillings a pound! Such are the deductions to be drawn from the report in question. In addition to this, it must be added that the China grass will, it is said, grow with as little trouble in the south, centre, and west of France, as it does in Algeria, the West Indies, Senegal, India, and Guiana.

Coal in France.—In excavating for the Bourbonnais Railway, says the *Progrès de Lyon*, at a distance of two or three hundred yards above L'Arbresle, a small town about fifteen miles from Lyons, a seam of coal, which is said to be good, has been laid open. This accidental discovery is considered highly important, as indicating a coal deposit in this neighbourhood at no great distance from the soil. France is not wanting in coal, but it exists in many cases where no economical means of transport are yet established. No doubt good coal in the neighbourhood of such an important manufacturing place as Lyons would be a great boon, but all the world knows how deceptive are such discoveries as the one referred to; and we have not a geological map of France at hand to tell us whether there is anything new in the existence of coal in that quarter. Such facts, however, deserve to be noted, now that the import of English coal into France has grown so enormously.

New Thermograph.—M. Marey, of Paris, has invented a new registering thermometer. It is an adaptation of the air thermometer, and consists in a metal bulb attached to a tube of the same, which is but a fifth of a milimètre, or 0·0079 inches, in interior diameter; the receiver or indicator of temperature is a glass tube, bent into the form of a half-circle, one extremity being closed and attached to the circumference of a metallic wheel, resting on knife edges, and counterpoised. A mercurial index is introduced into the glass tube, which it divides into two chambers, one closed and the other open; and the metallic tube of the thermometer is passed through the mercury, into the closed chamber of the glass tube. On the axis of the wheel above mentioned is an arm, carrying a tracing point, which marks the variations on a registering cylinder. When the bulk is heated the air passes into the closed portion of the glass tube, forces back the mercury, and of course disturbs the equillibrium of the apparatus to an extent marked by the tracing point on the cylinder. The metal air tube is furnished with a valve near the bulb, so that the interior may be placed in communication with the outer air, in order to set the apparatus at zero. This is one of the instruments furnished to the scientific expedition for Mexico.

Sun Motor.—The other day a means of cooking by the aid of the sun, was proposed by M. Babinet, of the French Institute; another professor, M. Mouchof, suggests an application of the sun as a motive power. If, he says, a bell or cylindrical reservoir, of thin silver, blackened within, be filled half with water and half with air, and let the sun's rays fall upon it through two bell glasses placed over it, the air will expand and press upon the water. If a tube with a stop-cock be inserted near the lower part of the silver reservoir and curved upwards into a vertical position, the water upon the opening of the cock will leap to the height of ten mètres, and the fountain will be maintained as long as there is any water in the receiver, but the moment any body intervenes between the sun and the receiver, of course the action diminishes, and soon ceases entirely. M. Babinet thinks that such an application of the sun's power might be of advantage in Egypt, where, as he says, "the sun costs nothing."

Scotch Pig Iron.—The export of Scotch pig iron in the first ten months of 1864 amounted to 551,929 tons, against 539,430 tons in the corresponding period of 1863, 487,676 tons in the corresponding period of 1862, 497,706 tons in the corresponding period of 1861, and 466,325 tons in the corresponding period of 1860. Notwithstanding some depression in the exports in September and October, this year's exports show, as compared with 1863, an advance of 14,499 tons; as compared with 1862 an advance of 64,253 tons; as compared with 1861 an advance of 54,223 tons; and as compared with 1860 an advance of 85,604 tons.

Slate in New South Wales.—Some pieces of slate have been brought down to Sydney, from a quarry on the property of the Ophir Mining Company, about twenty-five miles beyond Bathurst. The samples have been pronounced by competent judges of the material to be of a very good quality, and to be well adapted for flagging, making cisterns, and various other purposes. It is also stated that the edge of the slate would cut in two-thirds of the time that the Welsh slate takes to cut, by hand process, while with the chisel it cuts free and is not likely to flake up. The slate exists in great quantity at Ophir, and the discovery promises to be of considerable importance.

Preserved Fish.—Messrs. Marshall and Co. have commenced a fishery and curing establishment at Lake Macquarie, New South Wales, where they are preparing to go extensively into the business of supplying the citizens and the colonists of the interior with fresh fish, in hermetically sealed tins, after the manner of those sent out from England. At present, the number of men employed can turn out half a ton per diem of 1-lb. and 2-lb. tins of fish. The fish—caught in the lake, or immediately outside its entrance from the sea—consist of whiting, flathead, bream, snapper, salmon-trout, mullet, and guardfish, forming as good an assortment as can possibly be desired.

Silk Culture in Australia.—Mr. F. G. Croft, of Penrith, has purchased about 20 acres of land, near his residence there, to be applied to the cultivation of silk. He has also purchased the whole of the fine lot of mulberry trees (*Morus multicaulis*), belonging to Mr. John Muston, at the North Shore, specimens of the leaves of which excited such favourable attention at a late meeting of the Acclimatisation Society of Sydney.

Paper Making.—The directors of the Australian Paper Company have purchased, through Messrs. Richardson and Wrench, a portion of the Collingwood Estate, near Liverpool, New South Wales, for the purpose of carrying on the manufacture of paper. The land consists of about 17 acres, and is considered to be admirably situated for that purpose, having an extensive frontage to the George's River, whence an abundant supply of fresh water can be obtained. It can also be connected by a siding with the railway.

Commerce.

Cultivation of Tea in India.—The recent history of the Indian tea trade furnishes us with an instance of speedy and marvellous development almost without an equal in any department of modern commerce. Forty years have not yet elapsed since Major Bruce first announced his discovery of the tea plant in Assam, and now Indian tea occupies an important place in our import tables, and seems likely eventually to prove one of the great staples of Eastern commerce. When, in 1834, the committee appointed by Lord William Bentinck to report on the best method of cultivating tea in India, with what now appears to us an amusing timidity, recommended the Government to make some experiments on the Himalayan range and on the Neilgherry hills, it was little imagined that in thirty years large tracts of land would be under cultivation, that capital would largely be withdrawn from other, and even European, channels, to be invested in tea plantations, and that so profitable would the speculation be, that persons of rank and position would be found devoting to it their time, their energies, and their fortune. Marvellous, however, as is the recent growth of our Indian tea trade, its advance has, fortunately, at the same time, been a steadily progressive one. For several years after Lord William Bentinck's committee had ceased to sit, the exports of tea from India were miserably small, and were, indeed, commercially speaking, scarcely perceptible when placed side by side with the gigantic trade of China. The sales of Assam teas in 1847 were only 144,161 lbs., while, three years later, they amounted to 253,427 lbs. The amount of tea exported from Calcutta to Great Britain in the year ending October, 1861, was 1,624,030 lbs.; in the year ending October, 1862, 1,949,856 lbs.; in the year ending October, 1863, 2,724,046 lbs.; while, in the present year, it has risen to 3,343,663 lbs. But if the past has produced such results, what hopes may we not entertain for the future! We believe that we are not exaggerating when we assert that the supply of Indian tea for 1865 will show an increase over the present year of something like 25 per cent.; and when we remember the quality of the commodity itself, and the increasing value which every day's experience attaches to it, we must hesitate before we set down as the dream of an enthusiast, the assertion sometimes made by those interested in the enterprise, that the day will yet come when India may rival even China, and when England may receive not only her cotton, but her tea from her great Eastern dependency. Whatever truth there may be in these anticipations, it is certain that the increase of tea plantations in India must, ere long, produce a marked alteration in the social condition of the population of many parts of that vast empire. A new class of Europeans will be, and, indeed, are already being introduced into India—persons with comparatively small capital, but who are attracted by the enormous profits which are now to be realised by the growth of tea. The advent of these English planters will necessarily introduce a fresh, and, we think, a more healthy element into Anglo-Indian Society, will furnish the stimulus to native industry which is so much required, and will establish centres from which civilization may ultimately permeate the masses of the native population. A few years ago it might have been necessary here to notice and reply to the assertions then so confidently made by some would-be authorities to the effect that the supply we annually receive from China is so nearly all that the British market demands, that no great increase in Indian, or even Chinese production, could ever be made a paying speculation. Exaggerated as it may appear to readers of the present day, it is nevertheless true that Parliament, not so many years ago, was assured, on very distinguished official authority, that it was "more than probable that tea has now reached the limit of consumption in England, and that any reduction of taxation would not augment the use of this innutritious leaf." We need scarcely say that the experience of every year which has elapsed since this rash prophecy was uttered, has shown, in a very decisive manner, the folly of such Parliamentary utterances; and it may now be confidently asserted that, so long as Indian tea preserves its present strength and flavour, there is not the slightest fear of a falling off in the demand, let the supply from China be what it may. Groundless, however, as were such fears, it cannot be denied that there are difficulties which may injuriously affect our great Indian experiment. The *Englishman* recently sounded an alarm which, we believe, will be echoed by those who are well acquainted with the recent course of affairs in the tea provinces of India. The planters in Assam and Cachar find themselves at the present time threathened with the same dangers which in other countries proved fatal to the tea experiment. The labour question is proving the great stumbling-block in the way of ultimate success. We have it on the authority of Sir Emerson Tennent, that the abortive experiment in Ceylon terminated as it did, not on account of any fault connected with the soil or climate, but solely from the want of skilled labour. Again, the failure of the interesting attempt to introduce tea cultivation into South Carolina, made by Dr. Smith, of Greenville, in 1850, must, we believe, be traced to the same all-important cause. Examples such as these ought to be sufficient to impress us with a sense of the gravity of the present crisis in India. Misunderstandings between the planters and the coolies seem unfortunately to be constant throughout the north-eastern provinces of India, and, so far have matters gone, that the *Englishman* declares that, if something be not done, tea planting in Assam will soon become a losing speculation, and, at last, die out altogether. Without at all endorsing this very sweeping statement, we do not hesitate to say that serious injury may, at the present moment, be inflicted on the material prosperity of India, if some satisfactory settlement of the differences between the contending parties be not speedily arrived at. In every country into which coolie labour has hitherto been introduced very great difficulty has been found in arranging and working out the details of the peculiar contract system which forms the basis of all coolie engagements. The Government authorities have, in most cases, only been too ready to let matters take their own course, and to allow masters and coolies to settle their differences between themselves as they best like. This species of *laissez-faire* policy has, unfortunately, been pursued in Assam and Cachar, and threatens disastrous results. The Indian Government, however, have it in their power to apply a remedy to this state of things, and, by a stringent system of regulations binding fairly and impartially both masters and coolies, to restore while it is yet possible a good understanding between them, and thus save from destruction a rapidly-advancing branch of industry, which, while it is certain to conduce to the material prosperity, will also, we believe, ultimately be found an efficient instrument in the promotion of the moral and social regeneration of our great Indian empire.

Colonies.

Sydney Fish. — A collection of young fish from Sydney, consisting of Murray cod and Mauritius carp, have been safely deposited in Berrima River. The collection had been obtained by the Rev. Dr. Hassall from the Acclimatisation Society of Sydney, and by him brought to Berrima, for the purpose of propagation in the Wing Ecarrible.

Ailanthus Silkworm.—The following remarks were made by Dr. Bennett, at an ordinary meeting of the Sydney Acclimatisation Society:—Dr. Bennett reported that the ailanthus silkworms recently hatched had all perished. A number had been produced from the eggs sent by Mrs. Devonport from Adelaide. From being unable to procure their natural food at this season of the year, attempts were made to feed them on young lettuce and mulberry leaves, as well as the foliage of the castor oil tree; they eat leaves of the lettuce and white, but not the castor oil tree leaves. The first worms were produced on the 28th June, and the last died on the 19th July. It would be desirable in future to take precautions to prevent their hatching until the season arrives when the ailanthus tree developes its foliage.

Cotton in Queensland.—The cotton plantations have been very uncertain in their returns, and in some instances the crops in low situations have been totally destroyed by floods during the picking season, while on others a very profitable yield has rewarded the growers. It is rumoured that one company, established for the purpose of cotton cultivation, are about to abandon the undertaking. With the experience of the past few years as a guide to future operations it is anticipated that the result of next season will finally settle the question as to the profits to be expected from cotton growing in this colony.

New Zealand.—Seat of Government.—A subject which naturally excites a considerable amount of interest is the proposed removal of the seat of government from

Auckland to a site in Cooks Strait. The decision, it is supposed, must lie between the three towns of Wellington, Picton, and Nelson, and the Commissioners who have been appointed to make the selection are expected to reach Nelson very shortly.

New Zealand Telegraph.—Arrangements are so far advanced for establishing telegraphic communication between all the provinces of these islands that there is no doubt but it will be in full operation next summer. The wire and other apparatus was expected to shortly arrive.

Obituary.

M. Guillaumin, Publisher, Paris.—This gentleman who was carried off with fearful suddenness by disease o the heart, at the age of 63, held a very eminent position in connection with political economy and cognate matters. He was the founder, or joint founder, of the *Journal des Economistes*, and also of the Political Economy Society, and the publisher of the admirable *Dictionnaire de Commerce*, of the *Annuaire de l'Economie Politique*, and of a large proportion of all the works published of late years on similar subjects. M. Guillaumin was a man of cultivated mind and peculiarly engaging manners, and was, probably, the last representative of a most worthy class of publishers. He resided at his place of business, in the Rue Richelieu, and his house was the resort of all the most eminent political and social economists of the day. He belonged to the liberal party, but he was more remarkable as the friend and patron of all who advocated the removal of restrictions on trade and the amelioration of the condition of the working classes. He was a man of the highest integrity in all his connections, and his death is a loss, not only to the party with which he was connected, but also to France. A large number of eminent men followed the remains to their last home, and M. Passy, formerly Minister of Finance, delivered a simple and most touching address over the tomb, recording the hope that the work which M. Guillaumin had commenced would not die with him. He leaves no successor, his family consisting only of two daughters, who were his beloved companions and fellow-labourers.

Publications Issued.

Practical Dietary, for Families, Schools, and the Labouring Classes. By Dr. Edward Smith, F.R.S. (*Walton and Maberley*).—Dr. Smith has been long known to the members of the Society of Arts as an authority on questions of diet, and received one of the Society's medals, in 1861, for papers read by him, and researches made into the influence of alcohols and tea. During the present year the subject of dietary was largely discussed, under his presidency, at the Physiological Section of the British Association, and to that may probably be attributed the publication of this practical work on dietary. There can be no doubt that a work which might be a safe guide to the different classes of the community was much needed—one which should be cheap, and, while written with scientific accuracy, should be simple and practical in its directions. No writer of the present day, probably, possesses more of the qualities needed for such an undertaking than Dr. Smith, and his authority will be generally accepted. The preface informs the reader that "the following work is intended to be a guide to heads of families and schools, in their efforts to properly nourish themselves and those committed to their care; and also to clergymen and other philanthropists who take an interest in the welfare of our labouring population. It is essentially practical and popular in its aim, and therefore contains directions rather than arguments, but at the same time it is based upon the most advanced state of the science, and, except in the exclusion of many technical terms, is scientific as well as popular. The unusual interest with which the subject of dietary is now regarded, both in a personal and philanthropic point of view, leads to the hope that the publication of this work is not inopportune, and the more so that the Government has lent the most effective aid in the collection of facts, on which it is in fact founded, as shown by the Reports of the Medical Officer of the Privy Council for the years 1862 and 1863, and the press has warmly advocated the importance of the subject. But to clergymen and medical men, more than to others, do the labouring classes look for advice; and much of the usefulness of this and similar works must depend upon their efforts. Ladies, also, may exert the most beneficial influence, and, with a view to aid such efforts, I have added in an appendix certain forms of handbills suited for distribution to the poor." The reader will concur with the author, when he adds that "it cannot be doubted that as dietary is a most necessary and powerful agent in the treatment of disease, so is the due supply of food a chief means of preventing disease and diminishing the burdens of the community. Hence the subject has as much interest to the statesman as to the physician;" and we feel assured that the work in question will be extensively read and do good service.

The Farm Homesteads of England. By J. Bailey Denton, M. Inst. C.E., F.G.S., Honorary Member of the Royal Agricultural Society of Hanover, and Engineer to the General Land Drainage and Improvement Company. (*Chapman and Hall.*) To farm successfully with defective and ill-arranged buildings is no more practicable than to manufacture profitably in scattered, inconvenient workshops, in place of one harmoniously-contrived, completely-fitted mill. No one who is at all acquainted with the farmsteads of Great Britain can fail to be struck with their want of adaptation to the purposes for which they are required. Not only do those which were erected in the last century fail to agree with our improved modes of husbandry, but there will be no exaggeration in saying that they were not suited even to the requirements of those for whom they were built. In former years such buildings might be characterised as a medley of hovels and sheds, thrown together without system. They wanted the merit of convenient arrangement as much as of architectural design. Up to a very recent date, a professional education was considered rather to unfit a man for this branch of art; and the landlord had recourse to local talent, of whatever order it might be. The provincial builder was usually entrusted with the preparation of the plans, in the same way that the blacksmith and wheelwright were looked to for the implements of tillage. He performed this duty with but little reference to the site or character of the farm, and generally upon examples afforded in the neighbourhood. In fact the plan, under the pencil of a parsimonious landlord, was apt to be so curtailed as to be seriously detrimental to the conduct of business; while under that of a landlord used to yield to the whim of a tenant, it was expanded beyond desirable limits. There was not, what we have now arrived at under the stimulation of an imperious necessity, any collection of well-recognised axioms. In quarters where Farm Architecture has ceased to be treated as a mere matter of taste, and where the prosperity of the tenant has been shown to depend in a great measure upon the sufficiency and competence of the accommodation afforded by the homestead, its buildings have been designed with the requisite fitness for the farm, and constructed with a view to durability. Agriculture, in fact, has most properly come to be regarded as a manufacture; and the benefits arising from a perfect adaptation of the farm buildings to the various operations conducted within them are now generally admitted. Much careful attention, in different parts of the country, has of late been given to this subject, and several works have been published, setting forth plans and data of a very valuable description. These, however, have generally contained only the design of a single architect, and have mostly been issued to create or sustain professional repute. This course might have been followed in the present instance, but the editor has preferred to collect a series of the plans of many different designers, but adapted to the requirements of modern husbandry under all its phases of breeding, feeding, and dairying, in various localities and climates; being strongly impressed with the fact that what the landowner, farmer, and architect now require is an exposition of the leading principles of this branch of constructive art, as they are illustrated by accomplished results on the farms of our foremost agriculturists. Hence the desirability of a work like the present, which collects and records valuable precedents, and professes to give the present state of our knowledge on the subject. The editor has accordingly represented twenty-four specimens of homesteads, the plans being accompanied with descriptive matter not only concerning the buildings, but also the farms upon which they are situated, and the modes of husbandry to which they apply. They embrace covered homesteads, and homesteads distinguished by special accommodation for the rearing and feeding of all descriptions of stock; care having been taken to select examples from farms of various sizes as well as from those characteristic of different localities, in order that persons concerned may study precedents analogous to their particular requirements. It has been found desirable to combine with these plans, drawings of farm-houses and labourers' cottages, together with an illustrated digest of the principles of arrangement and construction which govern the details.

Notes.

POULTRY SHOW IN PARIS.—Five of the *salons* in the *Palais de l'Industrie*, the sides of which were covered a few months since with the productions of the artists of all nations, presented an extraordinary appearance on the 19th, 20th, and 21st instant. In place of history, battles, landscapes, and portraits, were collected the inanimate bodies of fowls, turkeys, geese, and ducks. The exhibition was a great success: there were more than five hundred contributors, and between two and three hundred specimens of poultry of one kind and another. Nineteen departments were represented. The arrangements were admirable; sloping tables were placed around, and double stands of the same kind in the centre of each room. These were covered with blue paper, upon which the poultry was laid out, with ample space on all sides, the various lots, each consisting of four specimens, being separated by fillets of wood, painted red, so that every article exhibited could be seen perfectly. On the walls were neatly-painted devices, containing the names of the classes and localities of production, and hung about with laurel, intermingled and enlivened by a few coloured ribbons. The first day was devoted to arrangement; the second, till one o'clock, to the decisions of the jury; after which the public was admitted at a charge of half a franc; and the third to exhibition and sale of the articles. The jury was composed of Comte Léopold Le Hon, President, representative in the Corps Legislatif of the department of Ain, famous for its poultry; two Inspectors-General of Agriculture, four farmers, and four dealers in poultry. The sum of four thousand francs was devoted to prizes, besides medals in gold, silver, and bronze. The grand prize consisted of a large gold medal and a thousand francs. The awards were marked by means of oval cast-iron tablets, painted blue, with the raised letters picked out in gold colour. The fowls were divided into five categories —birds of the races of La Bresse, of La Flèche, of Houdan, of Normandy, and miscellaneous. The first of these was by far the most numerous, as the poultry is the most esteemed. One gold, one silver, and a number of bronze medals and honourable mentions were awarded in each class, and the grand Prix d'honneur was awarded to M. Gorgondet, of Treffort, in the department of the Aix, for four pullets of the race of La Bresse. The other five classes consisted of turkeys, ducks, geese, pigeons, Guinea fowls, and other poultry. The department of Seine-et-Oise carried off the first and second prizes for turkeys, that of Orne the gold medal for geese, and Rouen the same for ducks. The fowls of La Bresse were not so remarkable for size as for smallness of bone and plumpness; and the manner in which they are prepared for market is quite artistic. Some of the geese were truly gigantic; but the turkeys would not have borne comparison perhaps with those of Leadenhall market. The sale was very brisk, and the names of almost every celebrated gastronomic establishment in Paris were to be seen on tickets in all directions. Forty and fifty francs were asked and easily obtained for prize geese and turkeys; and fowls that had obtained medals were marked in the morning after the exhibition as high, if not higher, than thirty-six francs each. Poultry is an article of great importance in France, and the rearing of fowls in La Bresse, Burgundy, is one of the staple occupations of the locality; but it is not carried on in large establishments, experience proving that the collection of large numbers of poultry in one place invariably gives rise to epidemics amongst them. The Bresse race is not, however, so pure as some others, the delicacy of the meat and the rapidity of the fattening being supposed to depend principally on soil and the mode of feeding. The Bresse pullet can be fattened at the age of three months, while those of other localities cannot be got ready for market till after the fifth or sixth month. The modes of rearing poultry differ in different localities. At La Bresse a pullet of three months is worth about two francs, and the fattening occupies from fifteen to thirty days. To produce what is called a fat pullet takes about five gallons of meal, made from maize and black wheat. This is mixed with curdled milk and given to the poultry in balls; the greater part are, however, only half fattened. A fine fat pullet sells for six to ten francs; an ordinary one for three to five francs at the local market of Bourg. The poultry of the Flèche race is fed in the department of the Sarthe, on barley and black wheat meal mixed in the same way with milk. Four young cocks, for which a prize was given, averaged eleven pounds (English) each, and were valued at 20s. to 24s. each.

SOUTH KENSINGTON MUSEUM "BOXING DAYS."—Since the opening, in 1857, the numbers each year have been as follows:—1857, 5,918; 1858, 9,683; 1859, 8,651; 1860, 5,957; 1861, 9,694; 1862, 5,962; 1863, 8,382. The annual average has thus been 7,750, but on Monday last the numbers exceeded 12,890.

WARMING OF RAILWAY CARRIAGES.—It is reported that experiments in warming carriages by steam have been made on the Royal Eastern line of Prussia, between Bromberg and Thorn, and with complete success. Previously the carriages reserved for ladies were warmed by means of hot sand or stones, but both were found insufficient or objectionable. In the new arrangement, a special boiler is placed in a luggage van, and the steam is conveyed, by means of junction pipes, into wooden cylinders, placed in all the carriages. Each compartment is provided with a small lever, which enables the travellers to regulate the temperature according to their feelings. During the experiments in question the heat was maintained at 22° Reaumur.

FRENCH ACADEMY OF INSCRIPTIONS AND BELLES LETTRES.—Mr. Edward William Lane, of London, has just been elected a corresponding member of this branch of the French Institute, in the place of Baron de Witte, promoted to the rank of Foreign Associate.

GERMAN PICTURES.—At the sale of the library of the late M. Favart, a copy of Lebrun's Gallery of Flemish, Dutch, and German Painters, sold for more than £10. Gilray's caricatures, a rare copy, with the 45 suppressed plates, fetched £8 odd. A curious collection of nearly 100 sketches on vellum and paper, representing Italian and German costumes, by various artists of the latter half of the 16th and the early part of the 17th century, was sold for £8.

Naphtha Springs.—The peninsula of Lenkoran (Asiatic Russia) contains numerous springs of naphtha. No less than 109 are now worked, and yielding annually about 4,000 tons of naphtha, similar to that brought from America. There are also many springs of the kind in the Isle of Taman.

Proposed Potteries Industrial Exhibition.—It was suggested at a recent meeting of the committee of the Hanley Mechanics' Institution that an exhibition of the productions of the workmen in that district should be held. The proposal was well received, and a committee was appointed to make the necessary preliminaries. Arrangements have been so far made that it is considered probable that the exhibition will be held in the month of April, and from the active way in which the committee are entering into the undertaking it is likely to prove very successful.

Scholastic Registration.—The General Committee for promoting this object, encouraged by the success which has attended the movement in favour of Scholastic Registration, has resolved to convene a public meeting of schoolmasters, and others interested in education, to consider the best means of bringing the question before the Legislature and the public. The meeting will be held, by permission of the Council of the Society of Arts, on Thursday, 5th January, at 2 p.m., at the rooms of the Society, John-street, Adelphi. The Hon. Secretary will read a report of the progress of the movement to this date, and will give an outline of the Medical Act, which has suggested the proposed Act, on a somewhat analogous plan, for the Registration of Schoolmasters and Teachers. Several gentlemen of influence will take part in the meeting; and it is hoped that all promoters of educational reform will endeavour to attend, and co-operate with those whose object is to obtain for the public some protection against incompetent educators, and for the profession the position to which its character and importance entitle it.

Public Works in Paris.—The Prefect of the Seine has just published his annual financial report, and from this and other official sources we learn the cost of the works carried on in Paris during the last twelve years. The amount expended on demolitions, reconstructions, and embellishments, that is to say, on extraordinary, as distinguished from the works of the city, is given as 900.666,627 francs, or, in round numbers, about three millions sterling on an average per annum. Of this total the city of Paris has supplied rather more than two-thirds, and the State less than a tenth; the balance being derived from a resale of land and other miscellaneous sources. The 900 and odd millions have been divided amongst various works in the following proportion:—Nearly 33 millions for charitable objects; religious edifices, upwards of 32 millions; municipal buildings and schools, more than 64 millions; the great market, nearly 12 millions; bridges and roads, nearly 50 millions; formation of new boulevards and streets, 590½ millions; extension of Paris to the fortifications, including the removal of the Octroi wall and gates, and construction of the new barriers, nearly 130 millions of francs. In 1859 Paris was lighted by 14,911 gas lamps, and the banlieue by 2,812 gas and 750 oil, making a total of 18,939 lights, now increased to 30,395. The great system of drainage is approaching its conclusion; and in the month of May next Paris will have its new river in the canal which is being constructed to bring the waters of the Dhuis to the capital; artesian wells have been sunk; large reservoirs for the supply of the city have been formed in the outskirts; half the theatres have been rebuilt; the parks and promenades have been planted and improved; many public squares have been planted and thrown open to the public; new roads and streets have been formed, and many old ones widened, ventilated, and otherwise improved. This is certainly a vast amount of work to have been done in a dozen years, even under the extraordinary circumstances of the case; and it is astonishing that even the immense sum given in the report in question should have been half sufficient for what has been performed. One of the most important, nay, the most important result attributed to the improved condition of the city is the reduction of the rate of morality. In 1836, when the first quinquennial census was made in France upón the present system, the deaths were 2·78 per cent., or in the proportion of one in 36 inhabitants annually; in 1841 and 1846 the rate was nearly the same; but in 1856 it had fallen to 1 in 39; and it now stated at about 1 in 40. With respect to future works a commission has been appointed to draw up a general programme based on the following questions:—What buildings require re-building or enlargement to meet the necessities of the public service? What will be the expence of each? and What is the degree of urgency of each, and in what order should they be undertaken?

Steam Omnibus.—Nantes was the birth-place of the omnibus, and to this day the original arrangement of a conductress swinging in a basket at the back is adhered to, and having been the first to supply horse flesh to the million, that busy town seems bent upon setting aside her own former pet in favour of a new one. A steam locomotive, with passenger carriages attached, has for some time attracted great attention in that place, and the accounts published are highly laudatory. The new conveyance is the invention of M. Lotz, an engineer of Nantes, and it has obtained the attention of the authorities. A short time since, at the request of the Prefect of the Department, the locomotive, with a *char-à-bancs* and an omnibus attached, was driven into the yard of the prefecture, where, it is said, it was turned round and moved about with singular facility. The Prefect and some few other gentlemen then entered one of the carriages, and the train was conducted through the streets of the town and towards the Paris road. At first the pace was that of an ordinary trotting horse, but when outside the town this was increased to more than sixteen kilometres—nine and a-half miles an hour. It is reported that the mode of attachment adopted by M. Lotz is so good that the locomotive, with two carriages in its train, turns in a circle of about thirty feet in diameter. If these reports be not a little too highly coloured, M. Lotz has been more successful than other engineers who have attempted the application of steam for ordinary traffic. And even supposing the triumph to be achieved, the question of cost still remains to be answered.

Electro-Magnetic Locomotive.—At a meeting of the Scientific Society of the Department of the Seine-et-Oise, held at Versailles a few days since, a model of an electro-magnetic locomotive was exhibited and explained by its inventors, MM. Bellet and De Rouvre. This new engine is intended to run on rails, and the arrangement of its parts is somewhat curious. The driving power is given to a single pair of wheels situated at the rear of the engine, as in the Crampton engines. A number of magnets are arranged radially on these wheels, their poles towards the circumference; the voltaic current is conducted from the centre of each wheel to all the magnets in succession, and these latter act directly on the iron rail itself. The inventors claim for their engine the great advantage of excessive simplicity, and moreover, that as the magnets act directly on the rails, there is a constant amount of adherence, which does away with the necessity of weight to ensure safety even with the highest speed possible. The inventors seem to have specially in view the postal and telegraphic service. They say:—"This machine may be employed to carry letters and parcels in the interior of towns at the rate of twelve or fourteen miles an hour, on subterranean railroads, connecting the principal post-offices; and as the locomotives for such service would be very small, the works would be comparatively inexpensive. Larger machines might run on the existing railroads, and convey despatches at the rate of a hundred and twenty miles an hour." The machine is ingenious, and doubtless works well in a model, but it remains to be seen whether it would be practical on a larger scale.

THE ATLANTIC CABLE.—The entire length of the Atlantic telegraph will be 2,300 miles. There are seven copper wires to form the conductor, so that there are 16,000 miles of copper wire. Every portion of this wire is subjected to electrical tests to ascertain its quality for conduction before it is allowed to be worked up. The next stage is to coat these with eight successive coats of the insulating material, equal to an aggregate length of 18,400 miles. This core is next covered with jute wound round it from ten strands, making 23,000 miles of jute yarn. Then comes the outer coating formed of the ten covered iron wires. The iron wire itself is 23,000 miles in length, and each wire is covered separately with five strands of tarred hemp, 135,000 miles of the latter being required, making together an aggregate length of material employed of 215,000 miles.

CHINESE AND JAPANESE WORKS.—A remarkable sale of Chinese and Japanese curiosities, stated to be the property of Mr. Marks, of London, took place in Paris on the 29th November. Two large garden stools, or table bearers, in incised enamel work, ornamented with flowers on a blue ground, fetched £248. A fine four-sided vase, of the same character, decorated with landscapes, kiosts, and scenes of industry, was sold for more than £68. A rock crystal ball, about 16 and 17 inches in circumference, realized upwards of £52. Five pieces of Chinese enamelled ware, ornamented with flowers and birds, the vases being about 13 inches high, sold for £108. Two vases in old Japan porcelain, 33 inches high, decorated with landscapes and flowers, in blue, red, and gold, realized nearly £59. A vase of old Chinese porcelain, decorated with agricultural scenes, rather more than 13 inches high, fetched nearly £44. And two vases of the same manufacture, with cameos of figures, animals, and flowers, in blue on a white ground, £60. The day's sale produced 42,868 francs (£1,715 nearly).

To Correspondents.

ERRATUM.—Page 95 in the last *Journal*, in Mr. Jones's speech, for "Loriners" read "Turners."

MEETINGS FOR THE ENSUING WEEK.

MON. ...Entomological, 7.
TUES.... Pathological, 8. Annual Meeting.
Photographic, 8.
Anthropological, 4. Annual Meeting.
Royal Inst., 3. Prof. Frankland, "On the Chemistry of a Coal." (Juvenile Lectures.)
WED. ...Pharmaceutical, 8.
R. Society of Literature, 8½.
THURS...Royal Inst., 3. Prof. Frankland, "On the Chemistry of a Coal." (Juvenile Lectures.)
FRI.......Philological, 8.
SAT.......Royal Inst., 3. Prof. Frankland, "On the Chemistry of a Coal." (Juvenile Lectures.)

Patents.

From Commissioners of Patents Journal, December 23rd.

GRANTS OF PROVISIONAL PROTECTION.

Aeriform fluids, &c., obtaining motive power from—3044—M. P. W. Boulton.
Artificial fuel, compounding by agglomeration—2920—G. M. de Bayelt and J. E. Vigoulete.
Beer engines, works and cases of—2869—R. G. Grimes.
Belt and sanatory apparatus—3034—W. E. Gedge.
Bridges, construction of—3069—A. J. Sedley.
Casks—3002—C. Smith and W. Fletcher.
Coal and coke, separating sulphur from—2998—C. Binks.
Coals, &c., revolving retorts for producing oil from—3020—J. G. Winter.
Cotton, ginning or cleaning—2982—E. W. Otway.
Cotton pieces in the gray, apparatus for finishing—2933—J. Eastwood and W. Wadsworth.
Electric fire buttons and indicators—2997—J. Sax.
Felt, manufacture of—3046—R. Richardson.
Fibrous substances, apparatus for preparing, &c.—3053—M. J. Roberts.
Fire-arms, breech-loading—3001—T. Wilson.
Fire-arms, &c.—2892—J. G. Tongue.
Gases, apparatus for the production of—3018—C. W. Siemens.
Gunpowder, &c., prevention of the accidental explosion of—3017—J. G. Ulrich.
Hair brush, mechanical—2999—J. Neat.
Hand stamps—3028—W. E. Newton.
Hollow ware, moulds for casting—3097—J. Crowley.
Human hair, apparatus used when brushing—3085—A. Brittlebank.
Iron, manufacture of—3071—J. Vaughan.
Jacquard machine—3105—J. and J. Leeming, and J. Lister.
Japanned ware and furniture, decoration of—3054—A. Smith.
Lighthouses, &c., apparatus for sounding bells on—3057—C. Oliver.
Meat, &c., rooms and places for curing and preserving—2995—T. Harris.
Metal tubes, &c., solid and seamless—3091—J. Barnsley.
Neck collars—2967—S. S. Maurice.
Ornamental fabrics, production of—3012—J. K. Crawford.
Photo-sculpture—3107—A. F. J. Claudet.
Pumps—3021—H. Wilson.
Railway carriages, apparatus for enabling the guard to keep all the doors closed until the train is to a stand-still—3067—J. Holly.
Railway carriages, locking and unlocking the doors of—3024—R. Shaw.
Railways and tramways—3081—W. A. Adams.
Ruche for chenille and upholsterer's trimmings—3036—G. Dixon.
Ships, propellers for—2996—J. Taylor.
Signals, railway carriage and passenger—3016—J. W. Proffitt.
Silver, &c., coating iron and steel with—3095—J. B. Thompson.
Sliding gasaliers, &c.—3022—R. Tye.
Smoke consuming apparatus—3032—A. Blampoil.
Sound, apparatus for rendering inaudible—3000—F. C. Rein.
Spring mattresses, folding—3004—S. P. Kittle.
Steam boilers—3052—W. Husband and J. Quick, jun.
Stones, &c., apparatus for breaking—3038—T. Archer, jun.
Submarine explosives, conveying and exploding—2582—W. M. Ryer.
Textile fabrics, manufacture of—3008—W. Pollock.
Throstle spinning, &c., apparatus for effecting the drag in—3087—A. Pemberton and J. Ford.
Travelling, combined stretcher, bed, cushion, and wrapper for—3040—A. H. Robinson.
Vegetable substances, obtaining extracts from—3101—P. F. Lunde.
Weights, raising and lowering—2993—J. Soper.
Wet gas meters—3059—E. Myers.

INVENTION WITH COMPLETE SPECIFICATION FILED.

Straw hats, &c., shaping and pressing—3099—G. W. Belding and D. E. Holman.

From Commissioners of Patents Journal, December 27th.

PATENTS SEALED.

1605. J. M. Johnson & J. Buckley.
1616. T. Thomson and J. Murray.
1624. C. Frielinhgaus.
1627. M. L. J. Lavater and E. W. Niblett.
1628. R. A. Brooman.
1632. A. Kimball.
1634. W. Brookes.
1637. D. Gallafent.
1638. F. L. H. Danchell.
1639. T. Day, sen., & T. Day, jun.
1644. E. T. St. L. MacGwire.
1649. A. Thomas.
1653. N. Jarvie and W. Miller.
1658. W. Jackson, T. Glaholm, and S. S. Robson.
1660. A. S. Tomkins.
1679. A. B. Baron Von Rathen.
1744. V. Pean and A. F. Le Gros.
1746. J. Lewis.
1794. W. McI. Cranston.
1795. F. Seebohm.
1823. A. V. Newton.
1848. J. C. Ramsden.
1849. J. Jeffreys.
1873. W. Anderson.
1930. P. G. B. Westmacott.
1949. A. H. A. Pflughaupt.
1970. J. H. Johnson.
2022. J. Hodgart.
2046. G. Coles, J. A. Jaques, and J. A. Fanshawe.
2406. J. T. Pendlebury.
2462. H. Nelson.
2507. G. Coles, J. A. Jaques, and J. A. Fanshawe.
2664. E. J. W. Parnacott.
2689. B. Scalé.
2714. E. L. S. Benzon.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

3212. W. Kempe.
3271. W. E. Newton.
15. J. Howard and E. T. Bousfield.
22. G. Jeffries.
3214. J. H. Johnson.
3216. C. Smith.
3217. J. Rosindell.
3218. C. Smith.
3227. G. H. Birkbeck.
3249. E. Lord.
3251. M. Henry.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

3136. W. Basford.
3177. I. Holden.
3183. E. Gomez and W. Mills.
3150. A. F. Kynaston.
3188. T. Booth.